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Investigation of the Learning Styles of Pre-Service Sports Teachers Enrolled at a Pedagogical Formation Program

Sabahattin Deniz, Süleyman Can
Education Faculty, Mugla Sitki Kocman University

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ABSTRACT

The purpose of the current study is to investigate the learning styles of the students from the Faculty of Sports Sciences. These students are enrolled at the pedagogical formation program and attending different departments of the Faculty of Physical Education and Sports. The study is a descriptive study employing the general survey model. As the data collection tool, "Vermunt Learning Styles Scales (VLSS)" was used. The study group of the current research is comprised of Sports Sciences Faculty students enrolled at the pedagogical formation program at the Education Faculty of Muğla Sıtkı Koçman University in 2016-2017 academic year. The findings of the study revealed that while the re-service sports sciences teachers' study activities (information processing and organization) and study motives (mental model of learning and learning orientation) do not vary significantly depending on gender, age, branch, the state of having a coaching license or not and the state of working in a job or not, they vary significantly depending on department (coaching, sports management, recreation, physical education and sports teaching) and general academic achievement

Corresponding Author:

Süleyman Can,
Departement of Elementary Education,
Mugla Sıtkı Kocman University,
Kotekli, Mugla County 48000, Turkey.
Email: scan@mu.edu.tr

1. INTRODUCTION

Attempts made to design learning-teaching environments according to new approaches have resulted in greater opportunities for individuals with different learning styles. No matter what the relevant discipline is, teacher training systems have always felt the need to get to know their students, so that they can develop and apply suitable educational programs for them. In this regard, the need for seeking answers to the questions such as "How can we teach the best?" and "What are the differing learning preferences of individuals?" has become indispensable for teacher training institutions to keep up with new trends and changes so that they can train more qualified and efficient individuals. Teacher qualifications are known to be influential on student achievement. Learning how to think or controlling learning in the mind; that is, the construction of cognitive awareness is associated with the learner's control of knowledge and self-control and process and preparation for the act of learning [1]. This entails the individual's recognizing his/her different characteristics involved in learning and adjusting his/her preferences according to these characteristics. Each learner's construction of his/her own learning styles depends on his/her receiving the information from the outer world, processing it and learning it through different ways and acquiring it according to his/her individual characteristics [2, 3]. Vermunt (1996) emphasizes that how student learn cognitively, metacognitively and affectively (internal and external) is important. Moreover, he investigate learning at different dimensions of cognitive learning strategies, metacognitive strategies, the mental model of learning and learning propensities. These dimensions have been identified as, (A) Study activities; 1. Information processing strategies (making connections, organizing, critical thinking, memorization, repetition, analysis

and concrete operations) 2. Organization strategies (Self-organization of learning processes and outcomes, self-organization of learning content, external organization of learning processes, external organization of learning outcomes, lack of organization). (B). Study motives (opinions about studying and study motivation) are defined as 3. The mental model involved in learning (construction of knowledge, acceptance of knowledge, stimulus training, cooperation). 4. Learning propensities (individual interest, confirmed aim, tendency towards self-evaluation, occupational propensity, undecided) [4].

Identification of how students process information and what their studying motives are in learning-teaching processes and defining how they can be connected with some variables are influential on learners' ways of designing learning. Therefore, recognizing learners' learning styles in learning-teaching environments and analyzing them are always of great importance [5]. There are some studies pointing to the positive effects of recognizing learners' learning styles on their academic achievement [6, 7, 8].

Sports sciences students are accepted to the respective departments on the basis of a set of special talent exams. They are especially selected from among the individuals with developed zone of physical intelligence. Physical intelligence zone refers to the individual's capacity of using certain parts of the body to solve problems, construct a model or create a product [9]. Physical and kinesthetic aspects are the prerequisite of learning. Particularly physical and kinetic abilities require the use of special talents in learning. They prefer to learn by doing, moving, experiencing and trying. They become efficient in learning with their talents such as coordination, balance, strength, flexibility and speed. Therefore, when the students having such talents want to be teachers, it becomes important for them to receive pedagogical formation. Understanding the learning styles of students continuing their education or having completed their education in different branches of sports sciences is of great importance to design a suitable learning-teaching environment for training them as teachers or educators. A skilful instructor knowing the power of learning styles makes use of various ways of teaching to facilitate the understating of the subject for students [10]. In this respect, he/she knows that the effect of different ways of presentation varies from one learner to another. According to [11], teachers' adaptation to different learning processes by understanding their own individual learning needs is associated with their own learning styles. Thus, determination of the learning styles of pre-service physical education and sports teachers, who may be appointed as teachers in the future, is viewed to be important for their participation in learning-teaching process with an awareness of their own learning styles.

The purpose of the current study is to determine whether the pre-service sports sciences teachers' learning styles vary significantly depending on gender, age, doing active sports as a licensed athlete, branch, department, coaching in his/her branch, working in a job outside his/her branch and general grade point average.

2. RESEARCH METHOD

The current study is descriptive study conducted in line with the relational survey model. Survey models are research approaches intended to describe a past or present state as it was or it is [13].

2.1 Study Group

The study group of the current research is comprised of senior students randomly selected from among the students attending the Departments of Coaching, Recreation, Sports Management and Physical Education and Sports Teaching and enrolled at the pedagogical formation program at the Education Faculty of Muğla Sıtkı Koçman University in 2016-2017 academic year.. The demographics of the participants are given in Table 1.

When Table 1 is examined, it is seen that of the participating students, 72 (35.8%) are females and 129 (64.2%) are males; 60 (29.9%) are from the coaching department, 42 (20.8%) are from the department of sports management, 60 (29.9%) are from the department of recreation, 39 (19.4%) are from the department of physical education and sports teaching; 173 (86.1%) are in the age group of 21-25, 24 (11.9%) are in the age group of 26-30, 4 (2%) are in the age group of 31-35; 125 (62.2%) prefer team sports and 76 (37.8%) prefer individual sports; 67 (33.3%) are athletes with a license, 134 (66.7%) are not; 55 (27.4%) are coaching in a specific sport and 146 (72.6%) are not; 64 (31.8%) are working in a job outside their branches and 137 (68.2%) are not; 138 (68.7%) have a low general grade point average, 51 (25.4%) have a medium general grade point average and 12 (6%) have a high general grade point average.

Table 1. Frequencies and percentages for the demographics of the participants

		f	%
Gender	Female	72	35,8
	Male	129	64,2
Age	21-25 years old	173	86,1
	26-30 years old	24	11,9
	31-35 years old	4	2
Having a sports license	Yes	67	33,3
	No	134	66,7
Branches	Team sport	125	62,2
	Individual sport	76	37,8
Department	Physical education and sports teaching	39	19,4
	Coaching	60	29,9
	Recreation	60	29,9
	Sports management	42	20,8
Having a coaching certificate	Yes	55	27,4
	No	146	72,6
Working in a job outside the branch	Working	64	31,8
	Not working	137	86,2
General grade point average	Low	138	68,7
	Medium	51	25,4
	High	12	6,0

2.2. Data Collection Tools

In the current study, in order to determine the learning styles of the participating pre-service teachers, "The Vermunt Learning Style Scale" developed by Vermunt [14] and adapted to Turkish by Şeker [4] and "Personal Information Form" were used. The Vermunt Learning Style Scale has 100 items designed in the form of five-point Likert scale. These 100 items were reduced to 76 in the Turkish adaptation study. The scale consists of Part A (study activities) and Part B (study motives and opinions about study). The response options to the items in the part of study activities are scored as follows; "I rarely or never do this" 1 point; "I sometimes do this" 2 points; "I regularly do this" 3 points; "I generally do this" 4 points and "I nearly always do this" 5 points. The response options to the items in the part of study motives and opinions about study are scored as follows "Strongly disagree 1 point; "I disagree with much of it" 2 points; "Undecided or I do not know" 3 points; "I agree with much of it" 4 points and "Strongly agree" 5 points. In the current study, Cronbach Alpha coefficient for the whole of the scale was found to be $\alpha = 0.76$. It was found to be $\alpha = 0.64$ for the sub-dimension of study activities, $\alpha = 0.54$ for the sub-dimension of study motives and $\alpha = 0.64$ for the sub-dimension of opinions about study.

2.3. Data Analysis

In the analysis of the data, first frequency distribution of the participants' demographics was examined. Then, frequencies, percentages were calculated and t-test and one-way variance analysis were run. The analyses were performed in SPSS 20 program package. The significance level in the analyses was set to be 0.05. Whether the research data exhibited a normal distribution was checked with Kolmogorov-Smirnov Test. In cases where the distributions were not normal Mann-Whitney U test was used. As a result of Levene test conducted to test the homogeneity of the variance, Dunnet C test was run to determine the source of the difference [15].

3. RESULTS AND ANALYSIS

In this section of the study, findings related to the purpose of the study are presented.

3.1. Findings Related to the Question "Do the Pre-service Sports Sciences Pre-service Teachers' Learning Style Scores Vary Significantly Depending on Gender?"

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on gender was investigated. The findings obtained from t-test analysis conducted to this end are presented in Table 2.

Table 2. T-test results showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on gender

Dimensions	Gender	N	$\bar{X}$	SS	Sd	Levene Test		t Test	
						F	P	t	p
Study Activities	Female	72	3,17	0,646	199	0,430	0,513	0,605	0,546
	Male	129	3,11	0,645					
Study Motives	Female	72	3,64	0,491	199	0,645	0,423	0,984	0,326
	Male	129	3,56	0,574					
Opinions about Study	Female	72	3,84	0,681	199	2,284	0,132	1,498	0,136
	Male	129	3,70	0,681					

The results of t-test conducted to see whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on gender revealed that they did not vary significantly [Study activities (N=72), Female $\overline{X}$ = 3,17; (N=129), Male $\overline{X}$ = 3,11; t= 0,605, p>0.05; Study motives (N=72), Female $\overline{X}$ = 3,64; (N=129), Male $\overline{X}$ = 3,56; t= 0,984, p>0.05; Opinions about study (N=72), Female $\overline{X}$ = 33,84; (N=129), Male $\overline{X}$ = 3,70; t= 1,498, p>0.05].

3.2. "Findings Related to the Question "Do the Pre-service Sports Sciences Pre-service Teachers' Learning Style Scores Vary Significantly Depending on Age?"

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on age was investigated. The findings obtained from one-way variance analysis conducted to this end are presented in Table 3.

Table 3. One-way variance analysis results showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on age

Dimensions	Source of the variance	Sum of squares	Sd	Mean of squares	F	p
Study Activities	Between-groups	0,078	2	0,039	0,093	0,911
	Within-groups	83,092	198	0,420		
	Total	83,170	200			
Study Motives	Between-groups	0,286	2	0,143	0,477	0,621
	Within-groups	59,315	198	0,300		
	Total	59,601	200			
Opinions about Study	Between-groups	0,060	2	0,030	0,072	0,931
	Within-groups	82,895	198	0,419		
	Total	82,955	200			

The results of one-way variance analysis conducted to see whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on age revealed that they did not vary significantly [Study activities, F= 0,093, p>0.05; Study motives, F= 0,477, p>0.05; Opinions about study, F= 0,072, p>0.05].

3.3. "Findings Related to the Question "Do the Pre-service Sports Sciences Pre-service Teachers' Learning Style Scores Vary Significantly Depending on Whether Being a Licensed Athlete?"

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on whether being a licensed athlete was investigated. The findings obtained from t-test analysis conducted to this end are presented in Table 4.

The results of t-test conducted to see whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on whether being a licensed athlete revealed that they did not vary significantly [Study activities (Yes = 67, $\overline{X}$ = 3,17; No= 134 $\overline{X}$ = 3,12; t= 0,210 p>0.05), Study motives (Yes 67, $\overline{X}$ = 3,39; No = 134, $\overline{X}$ = 3,58; t= 0,152 , p>0.05)]. However, according to the results of Levene test, the variance is not equal and whether the pre-service science teachers' learning styles scores vary significantly depending on the scores taken from the sub-dimension of "opinions about study" was tested with Mann Whitney-U test. The findings obtained are as follows (A licensed athlete N= 67, mean rank =99,87; not doing sports with a license = 134, mean rank =101,56; U= 44413,50 p>0.05).

Table 4. The results of t-test showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on whether being a licensed athlete

Dimensions	Being a licensed athlete	N	$\bar{X}$	SS	Sd	Levene Test		t Test	
						F	P	T	p
Study Activities	Yes	67	3,14	0,759	199	4,183	0,042	0,210	0,834
	No	134	3,12	0,582					
Study Motives	Yes	67	3,59	0,586	199	0,849	0,358	0,152	0,879
	No	134	3,58	0,526					
Opinions about Study	Yes	67	3,72	0,652	199	0,000	0,983	-0,453	0,651
	No	134	3,78	0,641					

3.4. Findings Related to the Question "Do the Pre-service Sports Sciences Teachers' Learning Style Scores Vary Significantly Depending on the Branch Variable?"

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on the branch variable was investigated. The findings obtained from t-test analysis conducted to this end are presented in Table 5.

Table 5. The results of t-test showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on the branch variable

Dimensions	Branch	N	$\bar{X}$	SS	Sd	Levene Test		t Test	
						F	P	T	p
Study Activities	Team Sport	125	3,12	0,656	199	0,001	0,975	-0,203	0,840
	Individual Sport	76	3,14	0,628					
Study Motives	Team Sport	125	3,58	0,540	199	0,157	0,693	-0,052	0,958
	Individual Sport	76	3,59	0,558					
Opinions about Study	Team Sport	125	3,75	0,617	199	0,758	0,385	-0,081	0,936
	Individual Sport	76	3,76	0,689					

The results of t-test conducted to see whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on the branch variable revealed that they did not vary significantly [Study activities (team sport = 125 $\overline{X}$ = 3,12; individual sport = 76 $\overline{X}$ = 3,14; t= -0,203 p>0.05), Study motives (team sport = 125 $\overline{X}$ = 3,58; individual sport = 76 $\overline{X}$ = 3,59; t= 0,052 p>0.05), Opinions about study (team sport = 125 $\overline{X}$ = 3,17; individual sport = 76 $\overline{X}$ = 3,12 ; t= -0,081 p>0.05)].

3.5. Findings Related to the Question "Do the Pre-service Sports Sciences Teachers' Learning Style Scores Vary Significantly Depending on Coaching?".

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on coaching was investigated. The findings obtained from t-test analysis conducted to this end are presented in Table 6.

Table 6. The results of t-test showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on coaching

Dimension	Coaching	N	$\bar{X}$	SS	Sd	Levene Test		t Test	
						F	P	T	p
Study Activities	Yes	55	3,19	0,613	199	0,009	0,927	0,763	0,446
	No	146	3,11	0,656					
Study Motives	Yes	55	3,61	0,509	199	0,662	0,417	0,474	0,636
	No	146	3,57	0,560					
Opinions about Study	Yes	55	3,87	0,574	199	0,200	0,159	1,624	0,106
	No	146	3,71	0,664					

The results of t-test conducted to see whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on coaching revealed that they did not vary significantly [Study activities (Yes = 55 $\overline{X}$ = 3,19; No = 146, $\overline{X}$ = 3,11), Study motives (Yes = 55 $\overline{X}$ = 3,61; No = 146, $\overline{X}$ = 3,57; t= 0,474, p>0.05), Opinions about study (Yes = 55 $\overline{X}$ = 3,87; No = 146 $\overline{X}$ = 3,71; t= -0,106 p>0.05].

3.6. Findings Related to the Question "Do the Pre-service Sports Sciences Teachers' Learning Style Scores Vary Significantly Depending on the Variable of Working in a Job?"

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on the variable of working in a job was investigated. The findings obtained from t-test analysis conducted to this end are presented in Table 7.

Table 7. The results of t-test showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on the variable of working in a job

Dimension	Working in a job	N	$\bar{X}$	SS	Sd	Levene Test F	Levene Test P	t Test T	t Test p
Study activities	Working	64	3,13	0,657	199	0,330	0,566	0,053	0,958
	Not working	137	3,13	0,641					
Study motives	Working	64	3,59	0,573	199	0,060	0,806	0,024	0,981
	Not working	137	3,58	0,534					
Opinions about study	Working	64	3,72	0,702	199	0,435	0,510	-0,471	0,638
	Not working	137	3,77	0,616					

The results of t-test conducted to see whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on the variable of working in a job revealed that they did not vary significantly [Study activities (Working = 64, $\overline{X}$ = 3,19; Not working = 137 $\overline{X}$ = 3,11; t= 0,763 p>0.05), Study motives (Working = 64 $\overline{X}$ = 3,61; Not working = 137, $\overline{X}$ = 3,57; t= 0,474 , p>0.05), Opinions about study (Working = 64 $\overline{X}$ = 3,87; Not working = 137 $\overline{X}$ = 3,71; t= -0,106 p>0.05].

3.7. Findings Related to the Question "Do the Pre-service Sports Sciences Teachers' Learning Style Scores Vary Significantly Depending on the Variable of General Grade Point Average?"

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on the variable of general grade point average was investigated. The findings obtained from one-way variance analysis conducted to this end are presented in Table 8.

Table 8. One-way variance analysis results showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on the variable of general grade point average

Dimension	Source of the variance	Sum of squares	Sd	Mean of squares	F	p	Significant difference
Study activities	Between-groups	3,248	2	1,624	4,024	0,019	AA-CC/CB, AA-BB/BA
	Within-groups	79,922	198	0,404			
	Total	83,170	200				
Study motives	Between-groups	1,753	2	0,877	3,000	0,045	AA-BB/BA
	Within-groups	57,848	198	0,292			
	Total	59,601	200				
Opinions about study	Between-groups	0,967	2	0,484	1,168	0,313	
	Within-groups	81,988	198	0,414			
	Total	82,955	200				

As can be seen in Table 8, the pre-service sports sciences teachers' learning styles scores taken from the sub-dimension of opinions about study [F= 1,168, p>0.05] do not vary significantly depending on the variable of general grade point average. However, the scores taken from the sub-dimensions of study activities (F= 4,024, p<0.05) and study motives (F= 3,000, p<0.05) vary significantly depending on general grade point average. In order to determine the source of the difference, Scheffe test was conducted revealing that in the sub-dimension of study activities, the pre-service teachers having AA (90-100 points) ($\overline{X}$ = 3,515) have more positive study activities than the pre-service teachers having CC/CB (70-74/75-79 points) ($\overline{X}$ = 3,059) and BB/BA (80-84/85-89 points) ($\overline{X}$ = 3,253) . In the sub-dimension of study motives, the pre-service teachers having AA (90-100 points) ($\overline{X}$ = 3,956) have more positive study motives than the pre-service teachers having BB/BA (80-84/85-89 points), ($\overline{X}$ = 3,542) and CC/CB (70-74/75-79 points), ($\overline{X}$ = 3,575).

3.8. Findings Related to the Question "Do the Pre-service Sports Sciences Teachers' Learning Style Scores Vary Significantly Depending on the Variable of Department?"

Whether the sports sciences pre-service teachers' learning styles vary significantly depending on the variable of department was investigated. The findings obtained from one-way variance analysis conducted to this end are presented in Table 9.

Table 9. The results of one-way variance analysis showing whether the pre-service sports sciences teachers' learning styles scores vary significantly depending on the variable of department

Dimension	Source of the variance	Sum of squares	Sd	Mean of squares	F	p	Significant difference
Study activities	Between-groups	1,672	3	0,557	1,347	0,260	-
	Within-groups	81,498	197	0,414			
	Total	83,170	200				
Study motives	Between-groups	0,383	3	0,128	0,425	0,735	-
	Within-groups	59,217	197	0,301			
	Total	59,601	200				
Opinions about study	Between-groups	4,223	3	1,408	3,522	0,016	BSÖ-ANTR./REK./SPY
	Within-groups	78,732	197	0,400			
	Total	82,955	200				

The results of one-way variance analysis revealed that the pre-service sports sciences teachers' learning styles scores taken from the sub-dimensions of study activities (F= 1,347, p>0.05) and study motives (F= 0,425, p>0.05) do not vary significantly depending on the variable of department; yet, the scores taken from the sub-dimension of opinions about study (F= 3,522, p<0.05) vary significantly. In order to reveal the source of this difference, Scheffe test was conducted revealing that the scores taken from the sub-dimension of opinions about study by the students from the department of physical education and sports teaching (BSÖ) ($\overline{X}$ = 3,964) are higher than those of the students from the departments of [Coaching (ANTR.) ($\overline{X}$ = 3,857), Recreation (REK.) ($\overline{X}$ = 3,646) and Sports management (SPY) ($\overline{X}$ = 3,588)].

4. CONCLUSION

Accoring to Gömleksiz and Demiralp [16], possession of effective study strategies and positive study attitudes by pre-service teachers is of great importance for both themselves and students they will educate in the future. Thus, determination of pre-service teachers' learning styles will help them acquire more permanent knowledge, skills and attitudes. The findings of the current study show the pre-service sports sciences teachers' study activities, study motives and opinions about study do not vary significantly depending on gender, age, being a licensed athlete, coaching in his/her respective branch, working in a job outside his/her branch. This indicates that the pre-service teachers' learning preferences do not change depending on these variables. On the other hand, it was found that the pre-service sports sciences teachers' learning styles vary significantly depending on the variables of department and general grade point average. In this regard, while their study activities and study motives do not vary significantly depending on the department variable, their opinions about study vary significantly. This difference is in favor of the pre-service teachers from the department of physical education and sports teaching. This seems to be quite natural as students accepted to the physical education and sports teaching know at the beginning that they have already gained the right to be a teacher. Moreover, it can argued that they use mental models more effectively while learning. In addition, opinions about study are affected by activities and learning zones (cognitive, affective and psycho-motor). When the general grade point average of the pre-service teachers are taken into consideration, it is seen that this variable led to significant differences in study activities and study motives of the pre-service teachers; yet, not in the opinions about study. The pre-service teachers having AA (90-100 points) have better study activities than the pre-service teachers having CC/CB (70-74/75-79 points) and BB/BA (80-84/85-89 points). Study activities are connected with pre-service teachers' information processing and organization processes. In study activities, it seems that the desired skills have not been thoroughly gained. In the sub-dimension of study motives, the pre-service teachers having AA (90-100 points) seem to have gained better study motives than the pre-service teachers having BB/BA (80-84/85-89 points) and CC/CB (70-74/75-79 points). Opinions about study (mental model of learning, construction of knowledge, acceptance of knowledge, use of knowledge, stimulation education and cooperation) were found to be not effective on increasing the general grade point average.

While some research in the literature reported that learning styles do not vary significantly by gender [17], some other research found that they vary significantly [15]. [18, 19]. Dinçol, Temel, Oskay, Erdoğan and Yılmaz [20], are of the opinion that matching pre-service teachers' criticizing styles with their instructors' learning styles and matching instructors' teaching styles with pre-service teachers' learning styles will positively affect pre-service teachers' achievement; however, it was found that such matching did not affect achievement. Demirbaş and Demirkan [21] found that individuals with different learning characters are more creative and emotional. Bozkurt [22] concluded that the pre-service history teachers prefer to be continuously active in learning activities. Güven and Kürüm [23] found a positive correlation between the pre-service teachers' some learning styles and critical thinking. Şen and Yılmaz [24] reported that the students with the internalizing learning style obtained higher values in solution and disintegration concept test than the students with the convergent learning style. Gencel [25] found that the students with the convergent learning style more positively perceive their problem solving skills.

5.RESULTS

As a result, it was concluded that the pre-service sports science teachers' study activities and study motives showed that they use the same learning styles in different departments. The difference in their opinions about study might have stemmed from their branch characteristics. Moreover, the pre-service teachers' academic achievement scores are affected by their study activities and study motives. Opinions about study are not effective on receiving a higher achievement score. In further research, investigation of different learning styles on larger samples selected from the faculties of sports sciences can be conducted. Moreover, studies using experimental methods can be conducted.

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